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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of	)	
	)	
RICHARD R. DICKSON et al.	)	Art Unit: 2856
	)	
Application No. 09/905,698	)	Examiner: Nashmiya Saqib Fayyaz
	)	
Filed: July 10, 2001	)	
	)	
For: EXHAUST GAS PARTICULATE MEASURING SYSTEM	)	
	)	
Attorney Docket No. 00-714	)	
	)	

Peoria, Illinois 61629-6490
November 16, 2005

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF ON APPEAL

Sir:

This is an appeal under 37 CFR § 41.37 to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office from the final rejection of Claims 1, 2 and 9 –13 of the above-identified patent application. These claims were indicated as finally rejected in an Office Action dated August 13, 2005. Attached herewith is a fee transmittal sheet authorizing payment of the $500.00 fee required under 37 CFR § 41.20 (b)(2). Please provide any extension of time, which may be necessary and charge any fees which may be due to Account No. 03-1129, but not to include any payment of issue fees.

(I) REAL PARTY OF INTEREST

Caterpillar Inc. of Peoria, Illinois is the assignee of the patent application and the real party of interest.

(II) RELATED APPEALS AND INTERFERENCES

A notice of appeal has also been submitted for co-pending patent application serial no. 10/692,871 (brief not yet submitted), which is a divisional application, filed in response to a restriction requirement during the prosecution of the present patent application serial no. 09/905,698.

(III) STATUS OF CLAIMS

Claims 1-13 are pending in the application.

Claims 1, 2 and 9 - 13 are rejected under 35 USC §103 (a) as being unpatentable over Hendren US Patent Publication 2003/0136177 and are being appealed.

Claims 3 – 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

These claims are shown in the Appendix attached to this Appeal Brief.

(IV) STATUS OF AMENDMENTS

Appellants filed a Response on July 13, 2005 after the final rejection contained in the Office Action mailed May 13, 2005. An Advisory Action mailed on August 9, 2005 stated that the aforementioned Response with the proposed amendment to the claims with the insertion of "non-collinearly" presents a new combination for the claims that raises new issues requiring further search and/or consideration. For purposes of appeal the amendment will not be entered.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 – Reference to Specification by page, line number and Figs.

Independent claim 1 specifically claims an arrangement for controlling the dilution air to a partial flow dilution tunnel of an exhaust gas particulate measuring system as set forth in the entire specification and Fig. 1. Specifically the dilution control arrangement is set forth in Fig. 3 and as set forth below.

1. A transient dilution air control arrangement **Page 6 paragraph 19 line 2 Figs 1-3 (element 110)** for controlling a dilution air supply **Page 4 paragraph 15 starting at line 2 to the end of the paragraph and Fig. 2** to an inlet of a partial flow dilution tunnel of a gas sampling system, the partial flow dilution tunnel being connected to an exhaust gas stream of an internal combustion engine **Page 4 paragraph 14 and Figs 1 and 2**, the gas sampling system having a first mass flow controller operatively connected to an inlet of the transient dilution air control arrangement **Page 4 and 5 paragraph 15 starting at line 3 through line 6 and Fig 2**, a second mass flow controller connected to an outlet end of the partial flow dilution tunnel and a filter interposed the second mass flow controller and the outlet end of the partial flow dilution tunnel **Page 5 paragraph 16 starting at line 1 through line 5**, said transient dilution air control arrangement comprising:

a constant mass flow stream; **Page 6 paragraph 19 starting at line 4 to the end of the paragraph and Fig 3 (element 112)**

a variable mass flow stream; and **Page 7 paragraph 20 and Fig 3 (element 114)**

wherein said variable mass flow stream is non-collinearly connected with said constant mass flow stream prior to the inlet of the partial flow dilution tunnel. **Pages 6 and 7 paragraphs 19 and 20, Fig 3, and paragraph 25 starting at the end of line 7 through the end of paragraph 26**

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issue at hand is whether Claims 1,2 and 9-13 should be rejected and held unpatentable under 35 U.S.C. § 103 (a) as being unpatentable over Hendren US Patent Publication 2003/0136177, specifically independent claim 1.

(VII) ARGUMENT

Discussion re: Patentability of Independent Claim 1

The Examiner rejected claim 1 in an office action dated November 15, 2004 under 35 U.S.C. § 103 (a) as being unpatentable over Hendren US Patent Publication 2003/0136177. On page 2 of the Official Action the Examiner presented the following argument:

The Examiner has rejected claims 1 and 9 under 35 U.S.C. § 103 (a) as being unpatentable over Hendren US Patent Publication 2003/0136177. As to claim 1, Hendren et al. disclose an emission sampling apparatus including a dilution tunnel 20 with inlet 17 with a sampling system 70, 72, 74 exhaust 11 of engine 12, flow control valve 28, second mass flow controller 36, filter 34 with a dilution air control valve 28, second mass flow controller 36, filter 34 with a dilution air control arrangement 42/50 having a constant mass stream exiting via fixed flow rate pump 29 and a variable flow stream "connected with" the constant stream via variably controlled solenoid valve 28 which provides a variable flow stream "prior to the inlet of the partial flow dilution tunnel", see figs 1-2. Further, it is noted that a mass flow controller, per se is not designated by Hendren et al. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have designated the computer controlled solenoid valve 28 as a mass flow controller as it performs the function of controlling the flowrate, as in a "mass flow controller".

Applicants amended claim 1 in response, paper dated February 15, 2005, to the November 15, 2004 rejection by adding the feature that "said variable mass flow stream is connected with said constant mass flow stream prior to the inlet of the partial flow dilution tunnel". This connection of a variable mass flow stream and a constant mass flow stream is not taught or suggested in the Hendren reference. The Hendren reference teaches that

dilution air is provided by a fixed flow rate pump 29 and the flow therefrom is controlled by a proportional solenoid valve 28. One skilled in the art would readily recognize that the proportional valve 28 creates a backpressure in the line from the fixed flow rate pump 29. This backpressure therefore causes the flow rate out of the pump 29 to be the same as the flow rate coming from proportional valve 28. Thus, what Hendren teaches is one stream of dilution air and that the quantity of dilution air being controlled by the proportional solenoid valve 28 and nothing more. Therefore the flow of air from the pump 29 is identical to the flow coming from the proportional valve 28. Hendren therefore cannot and **does not divide the dilution air** into a constant mass flow stream that is connected (summed, or otherwise combined) with a variable mass flow stream. Hendren only teaches the supply of dilution air, in a single stream that is controlled by way of the proportional solenoid valve 28.

The Examiner gave a final rejection to claim 1 in an Official Action dated May 13, 2005. During this action the Examiner used the identical argument that was used in the Official Action dated November 15, 2004.

Applicants again amended claim 1, in an effort to move the application to allowance, in a response dated July 13, 2005. Specifically, claim 1 was amended by including that the variable mass flow stream is non-collinearly connected with the constant mass flow stream prior to the inlet of the dilution tunnel. The non-collinear connection of a variable mass flow stream and a constant mass flow stream is not taught or suggested in the Hendren reference. The Hendren reference teaches that dilution air is provided by a fixed flow rate pump 29 and the flow therefrom is controlled by a proportional solenoid valve 28. One skilled in the art would readily recognize that the proportional valve 28 creates a backpressure in the line from the fixed flow rate pump 29. This backpressure therefore causes the flow rate out of the pump 29 to be the same as the flow rate coming from proportional valve 28. Thus, what Hendren teaches is one stream of dilution air and that the quantity of dilution air being controlled by the proportional solenoid valve 28 and nothing more. Applicants remind the Examiner that MPEP § 2143 Mandates the three criteria that must be met to provide a prima facia case for obviousness:

> "...three basic criteria must be met. First, there must be some motivation, either in the references themselves or in knowledge generally available to one

> of ordinary skill in the art, to modify the references or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claimed limitations."

Specifically, as now claimed in independent claim 1 the transient dilution air control arrangement controls dilution airflow by way of a variable mass flow stream that is non-collinearly connected with a constant mass flow stream prior to the inlet of the dilution tunnel. Therefore there is no motivation for controlling the dilution air flow by connecting a constant flow stream with a variable flow stream as is presently claimed in independent claim 1. Furthermore, the dilution control arrangement taught by the Hendren reference are different from the present invention by stating the dilution airflow is controlled in an inverse proportion to the ratio of intake air flow and the engine intake air flow at idle and therefore cannot provide a reasonable expectation of success. Lastly, the Hendren reference does not teach or suggest the features of claim 1. Applicants therefore contend that claims 2 and 9 add additional features to claim 1, which is believed to be in condition for allowance and respectfully requests reconsideration and withdrawal of the rejection under 35 USC §103 (a) of claims 1, 2 and 9.

In conclusion, Applicant contends that the Hendren reference does not teach or even suggest that which is set forth in independent claim 1 to provide a prima facia case for obviousness under 35 U.S.C. § 103 (a) and secondly that the latest amendment presented for claim 1 does not add new material that would require further search and consideration. As these points were presented in the response in the reply dated February 15, 2005.

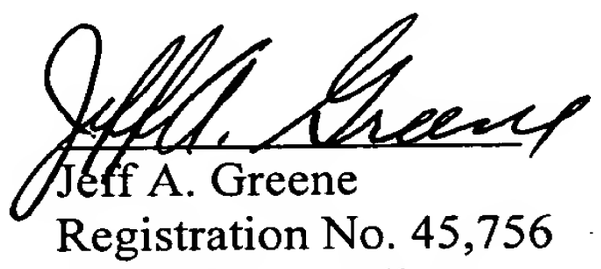
Lastly, Applicants are perplexed by the Examiners erroneous rejections throughout the prosecution of the present application. For instance, the Examiners restricting the original application into two distinct and independent inventions, claim sets 1-13 (present application under appeal serial no. 09/905,698) and 14-52 (pending application serial no. 10/692,871), and then rejecting both applications under the judicially created doctrine of obviousness-type double patenting.

Lastly Discussion re: Patentability of Claims 2 and 9-13

Each of Claims 2 and 9-13 each add additional limitations to Claim 1, respectively and include the limitations of the base claims from which they depend. Therefore, Claims 2 and 9-13 are allowable for the reasons hereinbefore discussed with regard to Claim 1.

Claims 1, 2 and 9-13 are patentable over the Examiner's rejection under 35 U.S.C. § 103 (a) over Hendren US Patent Publication 2003/0136177. Accordingly, the Board of Appeals is respectfully requested to reverse the rejection of the aforementioned claims.

Respectfully submitted,



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(VIII) CLAIMS APPENDIX

Claims

1. A transient dilution air control arrangement for controlling a dilution air supply to an inlet of a partial flow dilution tunnel of a gas sampling system, the partial flow dilution tunnel being connected to an exhaust gas stream of an internal combustion engine, the gas sampling system having a first mass flow controller operatively connected to an inlet of the transient dilution air control arrangement, a second mass flow controller connected to an outlet end of the partial flow dilution tunnel and a filter interposed the second mass flow controller and the outlet end of the partial flow dilution tunnel, said transient dilution air control arrangement comprising:

a constant mass flow stream;

a variable mass flow stream; and

wherein said variable mass flow stream is non-collinearly connected with said constant mass flow stream prior to the inlet of the partial flow dilution tunnel.

2. The transient dilution air control arrangement of claim 1, wherein said constant mass flow stream includes a pressure regulating valve serially connected with a critical flow venturi.

3. The transient dilution air control arrangement of claim 1, wherein said variable mass flow stream is connected in parallel with said constant mass flow stream.

4. The transient dilution air control arrangement of claim 3, wherein said variable mass flow stream includes a first pressure regulating valve serially connected with a dome loaded regulating valve and a mass flow transducer.

5. The transient dilution air control arrangement of claim 4, wherein said variable mass flow stream includes a pressure regulating valve serially connected to a voltage to pressure controller.

6. The transient dilution air control arrangement of claim 5, wherein said voltage to pressure controller is connected to and receives electrical inputs from a flow measuring device and said mass flow transducer, said flow measuring device being adapted to measure a flow of intake air to the engine.

7. The transient dilution air control arrangement of claim 6, wherein said voltage to pressure controller is connected to and sends pressure signals to said dome loaded pressure regulating valve.

8. The transient dilution air control arrangement of claim 7, wherein an output from said dome loaded pressure regulating valve and said constant mass flow stream supply dilution air to said partial flow dilution tunnel.

9. The transient dilution air control arrangement of claim 1, including a flow measuring device adapted to measure a flow of intake air, said flow measuring device being positioned in a conduit of an air intake of the engine.

10. The transient dilution air control arrangement of claim 9, wherein said flow measuring device is a laminar flow element being connected to a pressure differential transducer.

11. The transient dilution air control arrangement of claim 10, wherein said pressure differential transducer is connected to a selectable gain circuit.

12. The transient dilution air control arrangement of claim 11, wherein said selectable gain circuit is switchable to handle one of a single channel input and a multiple channel input.

13. The transient dilution air control arrangement of claim 12, wherein said selectable gain circuit is selectable between a plurality of course settings.

(IX) EVIDENCE APPENDIX -None-

(X) RELATED PROCEEDINGS APPENDIX –None-